

PROJECT facts

U.S. DEPARTMENT OF ENERGY
OFFICE OF FOSSIL ENERGY
NATIONAL ENERGY TECHNOLOGY LABORATORY



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PARTICIPANT

Great River Energy (GRE)
Underwood, ND

LOCATION

GRE's Coal Creek Station
Underwood, McLean County, ND

TOTAL ESTIMATED COST

\$28,201,721

COST SHARE

DOE \$11,000,000

Participant \$17,201,721



Clean Coal Power Initiative (CCPI)

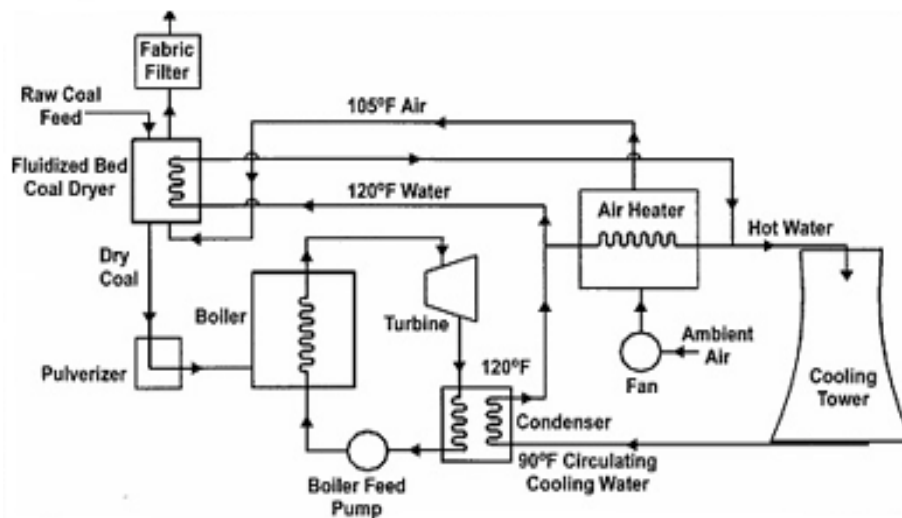
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INCREASING POWER PLANT EFFICIENCY — LIGNITE FUEL ENHANCEMENT

Project Description

Great River Energy, participant in this demonstration project, is collaborating with EPRI; Lehigh University; Barr Engineering, a Minneapolis, Minnesota firm with expertise in lignite and coal handling; and Falkirk Mining and Couteau Properties, the lignite coal supplier. The objective of this project is to demonstrate moisture reduction of lignite coal, thereby increasing its value as a fuel in power plants. The project will be conducted at the Great River Energy Coal Creek Station in Underwood, North Dakota. Demonstration activities will focus on using waste heat in the plant to lower the moisture content of the coal, typically about 40%. A phased implementation is planned; in the first phase, a full-scale prototype dryer module will be designed for operation of one of the pulverizers on one of the two 546 MW units at the Coal Creek Station. Following successful demonstration in the first phase, Great River Energy will design, construct, and perform full-scale long-term operational testing on a complete set of dryer modules needed for full power operation of one 546 MW unit. The coal will be dried to a number of different moisture levels. The effect of coal drying on plant performance will be measured, and optimum-operating conditions will be determined. The following figure depicts how the demonstration project will be integrated into the existing Coal Creek Station:

Benefits



ADDITIONAL TEAM MEMBERS

Electric Power Research Institute (EPRI)

(collaborator)

Lehigh University

(collaborator)

Barr Engineering

(lignite and coal handling)

Falkirk Mining and Couteau Properties

(lignite coal supplier)

ESTIMATED PROJECT DURATION

48 months

CUSTOMER SERVICE

800-553-7681

WEBSITE

www.netl.doe.gov

INCREASING POWER PLANT EFFICIENCY — LIGNITE FUEL ENHANCEMENT

This project offers a creative approach for using low-value, waste heat normally available in power plants, to increase the plant's efficiency, reduce pollution, and improve economics. When demonstrated, this technology could be applied to increase the generating capacity, efficiency, and cost-effectiveness of units that burn high-moisture coal. Currently, in the U.S. there are 29 operating plants burning lignite (15.3 GW) and more than 150 plants burning Powder River Basin (PRB) coal (more than 150 GW) with inherently high moisture content. Application of this technology could result in a reduction in the emissions from coal-fired power plants because the plants will require less coal after it is dried to produce the same amount of power. For example, in this project, the moisture in the lignite would be lowered from 38% to 29.5%. This is estimated to yield a 2.8%-5% efficiency improvement with an attendant benefit of 25% less SO₂ and 7% less mercury, carbon dioxide, nitrogen oxides and ash emissions per unit electricity output. This technology could increase the efficiency of plants running on PRB and lignite, which represents more than half of the coal electrical generation capacity in the U.S.



Coal Creek Station